COOPERATOR'S MONTHLY COLUMNS

MONONGAHELA NATIONAL FOREST

We are concluding egg mass surveys on the Monongahela National Forest (MNF) compiling data to delineate the proposed treatment areas for 1991. There were slight differences in sequential plan 1 guidelines for conducting surveys this year. They were drawn to emphasize areas of high interest or "priority areas". Land that might be designated as priority areas include areas with threatened and endangered and/or special interest plants and animals or scenic areas, such as recreation areas, campgrounds and overlooks. Our surveyors concentrated on priority areas where they coincided with high male moth trap catches. They then proceeded to other areas of potential gypsy moth infestation.

Higher gypsy moth populations are located on the north and east sides of the MNF and a large portion of the forest has yet to be exposed to the full impact of dense populations of gypsy moth.

We held open houses in areas that qualify for intervention to obtain public input and deal with specific individual concerns. Dates and locations of open houses were: Petersburg, Jan. 28; Parsons, Jan. 29; Mt. Grove, Jan. 30. Open house hours were 12:00 Noon to 8:00 p.m. MNF staff were on hand at West Virginia Department of Agriculture meetings held in the Franklin and Harman areas.

ERIK NEFFLEN

GEORGE WASHINGTON NATIONAL FOREST

The George Washington National Forest treated 3,891 acres of National Forest land in 1990. These treatment areas included five recreation areas and three general forest areas. A total of 3,311 acres were treated with Bt and 580 acres were treated with Dimilin. The applications were made with helicopters fitted with Micronair rotary atomizers. The rate of application was 24 BIUs per acre for Bt and 0.03 lbs. per acre for Dimilin.

The objectives for treatment in the recreation areas included protection of foliage, reduction of nuisance caused by caterpillars and their frass (excrement), and reduction of egg mass densities. The objectives for treatment of the general forest areas were protection of foliage and reduction of egg mass densities.

Excellent foliage protection was obtained on most of the treated areas. A patch of severe defoliation was noted at Crabtree Falls, due to a miss by the pilot during application. Patches of defoliation occurred on the Muapin Fields area because gypsy moth caterpillars were primarily third and fourth instars at the time of treatment.

Reductions in egg mass density in the treated areas were observed as well. Values for the percentage reduction in egg masses relative to pretreatment levels ranged from 57-100%. Egg mass densities increased modestly at Crabtree Falls and Maupin Field. Egg mass densities in untreated areas adjacent to treated areas increased substantially.

JEFF WITKOSKY

BLUE RIDGE PARKWAY

The egg mass hunt on the Blue Ridge Parkway has ended and our seasonal field workers are hibernating 'till the spring hatch. The Parkway conducted egg mass surveys a little differently this year. In addition to the usual AIPM trap locations, we surveyed some 120 miles of road shoulder. By adding the road shoulder surveys, we hope to solve our problem of missing data.

The Parkway received some good news and some bad news from the 1990 egg mass counts. The good news: gypsy moth population at Whetstone Ridge (milepost 29) fell from 7,560 em/a in 1989 to 480 em/a in 1990. Bald Mountain Overlook (milepost 22.1) and Fork Mountain Overlook (milepost 23) also were success stories with greatly reduced egg mass counts. All of these areas received aerial treatments of Dimilin in 1990.

Now for the bad news: egg mass numbers increased dramatically at Humpback Rocks Visitor Center (milepost 5.8) and Yankee Horse Overlook (milepost 34.4). At Boston Knob Overlook (milepost 38.8), we were stunned to find 61,520 em/a.

To make matters worse and perhaps a sign of things to come, several moths were trapped as far south as Doughton Park Campground (milepost 239.2) in North Carolina. As a result, the Blue Ridge Parkway's gypsy moth squad has the uneasy feeling that is will be in the bug business for years to come.

BAMBI TEAGUE

APPALACHIAN GYPSY MOTH INTEGRATED PEST MANAGEMENT

DEMONSTRATION PROJECT NEWS

TERRY FREY - EDITOR VOLUME 4, ISSUE 2 FEBRUARY 1991

AIPM PROGRAM MANAGER'S COLUMN

This month's DPN features the AIPM geographic information system (GIS) and how we use it in the project. I want to share with you one of the exciting new directions we're moving in with our GIS.

The real value of GIS is as a tool to help planners recommend and managers make decisions. That is how we use our system in AIPM and have since the beginning of the project. For instance, the results of the male moth trap collections are plotted and mapped. Field coordinators use these maps to determine and prioritize egg mass survey locations.

We are now expanding the use of GIS in AIPM by evaluating its ability to help recommend where, when and how to conduct treatments that help meet our objectives. To do this we identify the information we need and questions we ask to make treatment related decisions. We then add this information (such as stand composition and condition, management objective, egg mass density, gypsy moth population trend, etc.) into the GIS and challenge it to provide output in terms of our treatment decision protocols.

We plan to include qualifiers such as public concerns, the presence of threatened/endangered species, nearness to water and ask

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AIPM GEOGRAPHIC INFORMATION SYSTEM

The AIPM Geographic Information System (GIS) is an important part of the data management and decision-making processes of the AIPM Project. The GIS was established with the inception of the AIPM Project and has been used to provide needed graphic and textual information to project decision-makers.

First, the spatial data that are collected is referenced to a specific geographic location on the earth. Second, the database information is linked to the geographic (or spatial) information and analyses can be done on both to help answer questions about the relationships between various types of natural and man-made phenomena.

Susan DeLost shows how the treatment block outlines are entered into the computer by the process of digitizing.

What is a GIS?

A GIS can be defined as a system of hardware, software, data, people, organizations, and institutional arrangements for collecting, sorting, analyzing, and disseminating information about areas on the earth. ("A Study of Land Information", U.S. Department of Interior, November 1990) AIPM's GIS closely follows that definition.

What makes a GIS more than just a database management system and more than a graphic output system?

Who is involved in the AIPM GIS?

Just about everyone associated with the project, in one way or another, is involved. The people who work directly with input of data, the analysis, and output of GIS products for the AIPM Project are located at four separate sites and represent three different organizations. These locations and the people involved are: Susan DeLost, at the Forest Service - AIPM

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office in Morgantown, West Virginia; **Greg Elmes, Jay Hutchison,** and **Alan Bond** at the West Virginia University Department of Geology and Geography in Morgantown; **Chuck Dull, Brian Spears,** and **Doug Rubel** at the Forest Service - Forest Pest Management Office in Atlanta, Georgia; and **Bill Ravlin, Shelby Fleischer, Andy Roberts, Susan Rutherford, Belinda Carroll,** and **John Young** at the Department of Entomology at Virginia Polytechnic Institute and State College in Blacksburg, Virginia.

What type of equipment is used in GIS?

Additional information about each treatment block is entered into the computer, edits are done, and a program is written to produce a map.

The primary GIS computer software that is used at each location is ARC/INFO and/or the personal computer version, pcARC/INFO. Each site has a different configuration of computer hardware and peripheral equipment, but data can be readily transferred back and forth through the use of 9-track computer tapes and floppy diskettes.

What types of data are entered in the GIS?

Each year, the data about the gypsy moth that the AIPM cooperators collect are entered into the GIS. These data themes include male moth trapping, egg mass survey, proposed treatments, and defoliation data. Analysis is done on the data and then maps and other products are made and distributed.

The male moth and egg mass data are collected on a special type of form which can be read into a computer, called an 'opscan' form. (See the November 1990 issue of the Demonstration Project News for more information about the data processing activities related to the male moth trapping and the egg mass survey data.)

The treatment data are sketched onto standard 1:24,000 scale U.S. Geological Survey (USGS) topographic maps or 'quads' by the appropriate state or federal manager and a copy of each map is sent to either the Morgantown (for West Virginia) or the Atlanta (for Virginia) Forest Service office. After some preliminary processing, the maps are ready to be put into the GIS by a process known as digitizing. Digitizing is a manual process in which a map is first mounted to a tablet or 'digitizing board'. This board is attached to a computer and communication is achieved with the aid of a device called a cursor. Points, lines, or areas of interest are then located on the map and by pushing a series of buttons on the cursor for each item to be entered, the data are sent to the computer. These functions are repeated for each map. It is often a very time-consuming and tedious process. After all of the maps have been digitized, additional processing is done, including the input of additional information for each digitized item. The individual map sheets are joined together in the computer, any inconsistencies resolved, and after some further processing, this data layer, or coverage, is ready for use.

Defoliation data are input in a similar manner, although the methods for obtaining the defoliation data vary. Some of the data are sketched onto the quads by means of aerial observation, some are interpreted from optical bar photography and then sketched onto the maps. Field checking is done on questionable areas.

Additional types of information are collected and input into the GIS, including state, county, city, forest, and park boundaries, roads, hydrology, and airport locations. U.S. Geological Survey 1:24,000 scale topographic maps or 'quads' are used as the base for many of the layers of information in the AIPM GIS. These data layers can be digitized as needed by the AIPM GIS specialists. In some instances the data layers may have already been digitized by another agency (such as the USGS) and tapes or CD-ROMs with that data can be purchased and loaded onto the computer. However, additional processing of that data is usually needed before it can be used in the GIS.

What types of things can be done to the data layers once they are part of the GIS?

A buffer of any size can be generated around each type of feature. For example, a buffer of 25-miles was generated around each airport that had been identified as a possible location for the base of treatment activities. A map was made showing the airport locations, the 25-mile buffer, the proposed treatment blocks, and the outline and name of each quad in the treatment area. That type of map can be used in answering questions such as - "from which airport(s) can this particular site be treated?" or "are there any sites that fall outside the 25-mile range?"

The DEMONSTRATION PROJECT NEWS is published Monthly by the Appalachian Integrated Pest Management (AIPM) Project. The first large scale project to employ integrated pest management against the gypsy moth, AIPM's mandate is to SLOW **THE SPREAD and MINIMIZE THE ADVERSE IMPACT of the gypsy moth in a 38 county, 12.8 million acre area of Virginia and West Virginia.**

Contributions, questions or comments may be sent to:

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COOPERATING ORGANIZATIONS

USDA Forest Service
- Northeastern Area State & Private Forestry (NA)
- Region 8 Forest Pest Management (R8-FPM)
- Northeastern Forest Experiment Station
- Monongahela National Forest (MNF)
- George Washington National Forest (GWNF)
- Jefferson National Forest (JNF)

Shenandoah National Park (SNP)
Blue Ridge Parkway (BRP)
Appalachian Trail (AT)
WV Dept. of Agriculture (WVDA)
VA. Dept. of Agriculture and Consumer Services (VDACS)
WVU Cooperative Extension Service
VPI & SU Cooperative Extension Service
USDA Animal & Plant Health Inspection Service (APHIS)
Westvaco Corporation
Glatfelter Pulp Wood Company
Environmental Action Foundation
VA Dept. of Forestry
WV Forestry Division
National Gypsy Moth Management Board

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The finished map is removed from the plotter. Another map produced at the Morgantown AIPM GIS office is shown hanging on the door behind Susan.

Other operations that can be performed on the data include the interpolation of point data to create an area-type depiction of that data. Both the male moth data and the egg mass data are collected as point type data, that is, a certain value (of male moths trapped or egg masses found) is recorded for a particular location. From that interpolation, an overall project-wide view of what the gypsy moth populations are doing can be created. (See the February 1989 issue of the DPN for an example of the area-wide depiction of the male moth data.)

Two data themes can be joined together in various ways. For example, the treatment data can be intersected with the defoliation data so that the resulting data layer contains just the areas that were treated and then defoliated (treatment failures). Other overlay processes can be done to create a new data layer from two or more existing data layers. This allows us to look at the data in different and never-before possible ways.

For more information about the AIPM GIS activities, call Susan DeLost at the Morgantown AIPM office at (304)291-4891.

SUSAN DELOST

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the system to actually propose treatment block boundaries based on the parameters we provide.

We expect this capability to be brought on line and become functional. It will enable project coordinators to rapidly focus on areas at risk, deal with them and move on to other tasks. When it becomes operational, it will be one of the major products of the AIPM Project.

ALLAN BULLARD